

ENVIRONMENT: SIGNIFICANT PERFORMANCE RELATED TO RESOLVING THE ENVIRONMENTAL LEGACY

Environment Strategic Goal: To protect the environment by providing a responsible resolution to the environmental legacy of the Cold War and by providing for the permanent disposal of the Nation's high-level radioactive waste.



The Hanford worker shown here in the Waste Encapsulation Storage Facility is using a pole manipulator to pick up cesium capsules under water to move them to another location in the pool and/or test them by a rapid up and down movement to verify that the inner capsule still moves. This is known as the "clunk test."

The Department has had an environmental mission since its establishment in 1977. This mission has become more important since the end of the Cold War, when the agency began to clean-up sites contaminated by a half century of nuclear defense work. The Department of Energy Strategic Plan reflects a restructured environmental cleanup program developed from an intensive "Top-to-Bottom Review" that revealed the Department was only managing risk rather than reducing it. Our aggressive new cleanup strategy emphasizes doing more real work, greater accountability, increased competition among contractors, innovative cleanup methods, and the use of performance-based incentives. This strategy will accelerate completion of the cleanup program by at least 35 years, to 2035 rather than 2070, reduce risk to the public and the environment, and save taxpayers \$50 billion in program costs. By the end of 2025, the Department will cleanup 108 of its 114 contaminated sites.



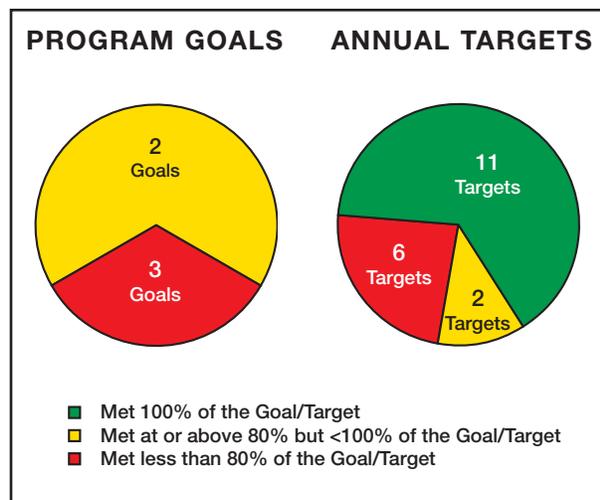
Sampling fish as part of the Savannah River Site environmental monitoring program.

The Department is also developing a geologic repository to safely dispose of high-level radioactive waste and spent nuclear fuel at the Yucca Mountain site in Nevada. The repository is needed to support the environmental cleanup of the Cold War legacy, as well as to enhance energy security by maintaining a viable nuclear option. Consolidation of nuclear waste from the many locations scattered across the country will promote our Homeland Security objective.



Stacks of solid nuclear waste storage containers in a shallow land burial site at the Idaho National Laboratory. The site, a 144-acre waste storage area for low-level radioactive solid wastes, is divided into a transuranic storage area and a subsurface disposal area. The transuranic storage area is designed for the interim storage of transuranic wastes.

FY 2003 PERFORMANCE AT A GLANCE



COSTS AT A GLANCE

ENVIRONMENT STRATEGIC GOAL COSTS (IN MILLIONS)		
GPRA PROGRAM ACTIVITY	FY 2003 Costs	FY 2002 Costs
General Goal 6 - Environmental Management	\$6,127	\$5,992
General Goal 7 - Nuclear Waste	\$95	\$81
TOTAL COSTS	\$6,222	\$6,073

GENERAL GOALS ASSOCIATED WITH THE ENVIRONMENT STRATEGIC GOAL

GENERAL GOAL 6 - ENVIRONMENTAL MANAGEMENT: Accelerate cleanup of nuclear weapons manufacturing and testing sites, completing cleanup of 108 contaminated sites by 2025.

The Environmental Management program was created in 1989 to safely manage the cleanup of the environmental legacy from 50 years of nuclear weapons production and nuclear energy research at 114 sites around the country. The scope of the program includes stabilization and disposition of some of the most hazardous materials known to man. The cleanup program resulting from over five decades of nuclear weapons production and energy research is the largest active cleanup program in the world, encompassing over two million acres at 114 sites. As of September 2003, the cleanup of 76 sites has been completed. An additional 32 sites will be remediated by 2025, leaving six sites to be addressed after 2025. In August 2001, the Secretary of Energy directed a "Top-to-Bottom Review" of the environmental cleanup program, which was completed in February 2002. The Review concluded that significant change was required in how the Department attacked risk reduction and cleanup. Two years ago, as costs continued to increase, the Department estimated that it could take over \$300 billion and nearly 70 more years to complete the cleanup. The environmental cleanup program stood as one of the largest liabilities of the Federal government.

The Top-to-Bottom Review concluded that the cleanup program was not prioritized to achieve the greatest reduction in risk to human health and the environment. Resources were diverted to lower risk activities and these processes, not risk reduction, had become the driving force. Fundamental change was required in how the Department approached, managed, and performed the entire cleanup program. Last year, the Department started to reform this massive program. The top priority for the program has been to reform and refocus the nuclear weapons cleanup program to deliver risk reduction faster and cleanup more efficiently and cost effectively.



RETRVIR is a Honda all-terrain vehicle equipped with a six-foot robotic arm for digging and picking up pieces of contaminated material and placing them in storage containers. RETRVIR drives itself using automatic planning software.



Control console at the Waste Receiving and Processing Facility at Hanford. Hanford's solid waste processing facility is the first in the Department's nation-wide complex built to handle transuranic wastes. The waste containers are staged, inspected by x-ray, and contents are assayed to determine the quantity of radioactive materials present.



Secretary Abraham visits single and double-shell tank farms in the 200 east area of the Hanford Site.

With the budget submitted for Fiscal Year 2003, the Administration made funds available to those sites that—in partnership with their regulators, their contractors, and their communities—changed their way of doing business to provide more tangible progress toward cleanup and risk reduction. The Department has defined risk reduction cleanup strategies on a site-by-site basis. The Department, in collaboration with its regulators and stakeholder communities, has developed plans which lay out the current site conditions, the desired end state, strategic initiatives to get from the current state to the end state, and management processes to support the new approach for 18 sites. The plans provide the site-specific strategies for the significant acceleration of risk reduction and cleanup completion including two of the Department's largest sites (the Hanford Site in Washington and the Idaho Laboratory in Idaho) at least 35 years earlier than originally planned.

The Department will achieve this goal through the implementation of eight strategies. Several of these strategies have been implemented in Fiscal Year 2003. First, the Department will eliminate significant environmental, health and safety risks as soon as possible. Second, the Department will review the remaining risks in concert with regulators and stakeholders to determine the most appropriate remediation schedules and approaches. Third, the Department will develop management systems that will force the establishment

of clearly defined and demanding performance goals. Fourth, the Department will improve its acquisition approach by clearly identifying the work to be done and the Department's expectations, establishing proper incentives for its contracts, and adequately rewarding performance. Fifth, the Department will hold its cleanup contractors to high safety standards; yet empower them to pursue the most direct path to success. Sixth, the Department will streamline surveillance and maintenance activities to further expedite cleanup. Seventh, the Department will ensure safe and secure management of nuclear materials and wastes. Eighth, the Department will refocus the cleanup science and technology program to directly address the specific, applied technology needs for cleanup and closure for the next five to ten years.



At the Integrated Demonstration Project, the Savannah River Technology Center demonstrates and evaluates innovative technologies for the cleanup of soils and groundwater plumes contaminated with volatile organic compounds.

These strategies will result in significant cost savings and a significant reduction in the time needed to complete cleanup—putting the taxpayers' dollars to more productive use.

EXTERNAL FACTORS

The following external factors could affect our ability to achieve these goals:

- **Regulatory Requirements:** Compliance with environmental laws and regulations and agreements with States drive the Department's cleanup decisions. The laws and regulations are subject to change, and agreements with States may be renegotiated.



Kit foxes peering from a culvert at a construction site at the Nevada Test Site. The Nevada Test Site is inhabited by a wide variety of animals ranging from kangaroo rats to mule deer and wild horses, from centipedes to rattlesnakes, and from bats to golden eagles. More than 30 species of birds have been identified, including robins, hawks, quail, and chukars. No hunting is permitted, and any employee who purposely harms an animal faces dismissal.

- **Cleanup Standards:** The end state for cleanup at many sites is not fully determined. The extent of cleanup greatly affects cost, schedule and scope of work.
- **Technology:** Technological development is inherently unpredictable. Suitable cleanup technologies do not always currently exist, and the development and deployment of innovative technologies could help reduce risk, lower cost, and accelerate cleanup.
- **Uncertain Work Scope:** Uncertainties are inherent in the environmental cleanup program, due to the complexity and nature of the work. There are uncertainties in our knowledge of the types of contaminants, their extent, and concentrations.

HOW WE SERVE THE PUBLIC IN THIS AREA

The Department is addressing the legacy of more than 50 years of nuclear weapons production and nuclear power research and development. Cleanup at the former weapons sites and research facilities often produces land and property that is suitable for beneficial reuse by the local communities, protecting the environment while creating economic development opportunities. Cleanup of contaminated soil and groundwater eliminates the risk of hazardous materials or chemicals from impacting the health of workers, the public and



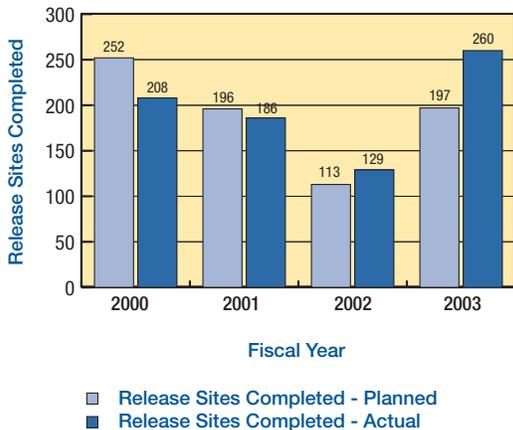
Transuranic waste stored at the Nevada Test Site.

the quality of the environment. Consolidation and safe storage of nuclear materials reduces the threat from terrorist acts, accidents or natural disasters.

PERFORMANCE RESULTS

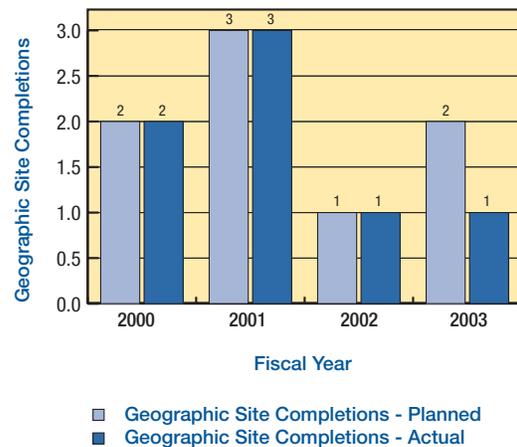
- The Department has made significant progress in the cleanup of sites, including the decontamination and decommissioning of facilities and cleaning up soil and groundwater contamination. Completion of cleanup activities at the Maxey Flats site in Kentucky brings the total number of sites completed to 76 of 114. The Department has generally exceeded its goals in this area. This translates into reduced landlord costs for the entire cleanup program.

The following chart shows the progress the Department has made in cleaning up release sites.



Fernald Ecological Restoration Park. The park includes public access and research demonstration areas that provide opportunities for local residents, workers and students to enjoy nature and study native plant and animal species.

- Waste management activities, including the storage, treatment and disposal of hazardous and radioactive waste were generally successful, with one exception. The goal to dispose of liquid radioactive waste was not met. The cause and implications of this are discussed below.
- Nuclear material packaging and stabilization activity results had mixed results. The packaging of nuclear materials such as plutonium and uranium and spent nuclear fuel that was completed greatly improves safety and will facilitate the continued storage or ultimate disposal or use of these materials.



Program Goal EM 1-1: By Fiscal Year 2006, complete cleanup at as many of the Department's 38 sites remaining at the end of Fiscal Year 2004 as possible. Continue cleanup at the remaining sites, including the five largest sites, scheduled for completion in the post-2006 timeframe.

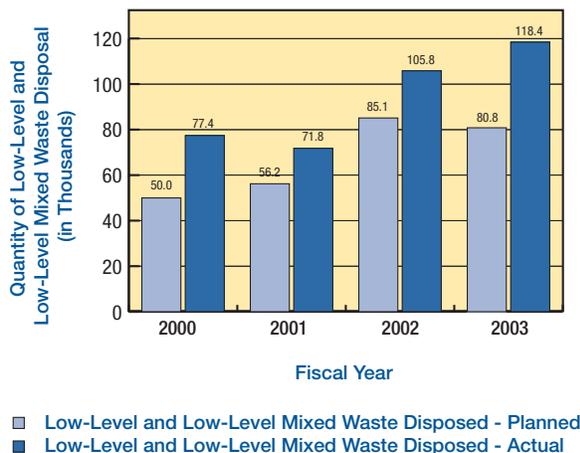


Savannah River Site technicians working at high-level waste cells. Work at the high-level cells includes miscellaneous testing, proving, sampling, and analysis of radioactive materials originating at Savannah River and other Departmental facilities.

Target EM 1-1a: Complete remediation at two additional geographic sites, the Maxey Flats Disposal Site in Kentucky and the Salmon Site in Mississippi, increasing the total completed to 77 of the 114 geographic sites.

Assessment and Commentary: Salmon Site remediation is complete and awaiting state approval. The site is currently working with the State of Mississippi in receiving its approval of the cleanup and transfer of the site to the appropriate party. State approval is expected in Fiscal Year 2004, upon which the site will be considered complete. The delay in receiving State approval does not impact achieving the program goal.

Program Goal EM 1-2: Safely and expeditiously dispose of waste generated during past and current Departmental activities. Continue shipment of transuranic waste for disposal at the Waste Isolation Pilot Plant.



In support of this goal, the Department also successfully disposed of large quantities of low-level and low-level mixed waste in Fiscal Year 2003, which is consistent with the Department's performance trend in the previous fiscal years.

Target EM 1-2c: Package 130 containers of high-level waste for final disposition.

Assessment and Commentary: Despite fewer than 130 canisters being produced in Fiscal Year 2003, the Savannah River Site actions taken during the year resulted in increased canister waste loading. As a result, the 115 canisters produced had a waste loading of 143 equivalent canisters. While this results in more waste per canister, the time to fill a canister has increased due to operational difficulties that resulted from the waste loading increase. A task team has been formed to optimize melter operations, and improved canister production times are being achieved. Further improvements are anticipated. With optimized waste loading, the expectation is to dispose of more waste in fewer containers. Altering the lifecycle number of canisters through the baseline change process is being considered. Therefore, Fiscal Year 2003 performance will not impact the final completion of this activity.

Target EM 1-2d: Ship 4,135 cubic meters of transuranic waste to the Waste Isolation Pilot Plant.

Assessment and Commentary: Fiscal Year 2003 target exceeded by 54 percent due primarily to performance efficiencies experienced by Rocky Flats, Richland, and Savannah River. Exceeding the target is an important indicator of the program's progress towards accelerating risk reduction and site closure.

The Mound Closure Project completed shipping all its legacy transuranic waste (266 cubic meters) to the Savannah River Site for interim storage. Completion of this activity frees up the "T" building where the waste was stored, for decontamination and decommissioning.

Battelle Columbus completed three shipments of transuranic waste to the Hanford site for interim storage. This shipment was the first remote-handled transuranic waste shipment from Battelle in thirteen years.



Program Goal EM 1-3: Stabilize nuclear material and spent nuclear fuel by producing safer chemical and/or physical forms of the material, and reduce the level of potential risk to personnel from radiation exposure and to the environment from contamination.

Target EM 1-3a: Package 2,836 containers of plutonium metal or oxide for long-term storage.

Assessment and Commentary: Fiscal Year 2003 target was exceeded by five percent. In exceeding the target and thereby reducing the inventory of high-risk nuclear materials and by preparing it for long-term storage, progress towards environmental, safety, and security risk reduction is demonstrated.

Target EM 1-3c: Package 934 kilograms of plutonium or uranium residues for disposition.

Assessment and Commentary: Fiscal Year 2003 target exceeded by 22 percent. In completing removal of remaining residues in Fiscal Year 2003, the Rocky Flats site is on schedule for site closure in Fiscal Year 2006.

At Hanford, all plutonium finishing plant residues were stabilized and packaged, in response to Defense Nuclear Facility Safety Board Recommendation 2000-1. This commitment was completed eight months ahead of schedule.

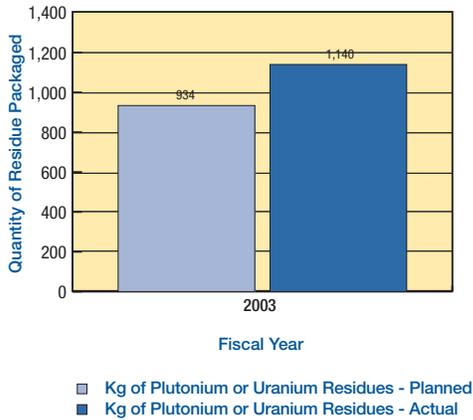
Target EM 1-3d: Package 857 metric tons of heavy metal spent nuclear fuel for disposition.

POTENTIAL IMPACTS TO ENVIRONMENTAL MANAGEMENT'S HIGH-LEVEL WASTE STRATEGY RESULTING FROM LITIGATION

The Department's high-level radioactive waste constituents vary greatly, including both radioactive and hazardous (chemical) components. While a portion of the radioactive isotopes present in high-level waste will remain dangerous for thousands of years, the vast majority of the waste contains short-lived isotopes. High-level waste treatment is the largest cost component of the Environmental Management cleanup plan. It is also the source of the largest share of the potential \$50 billion or greater cost savings associated with the accelerated cleanup plan. As such, the degree of success in implementing the high-level waste program will, to a large extent, determine the success or failure of Environmental Management's overall cost reduction and schedule acceleration goals. A key component of the high-level waste strategy is to separate the waste stream, concentrating the high activity waste (minimizing the volume for disposal at the Yucca Mountain repository) and finding safe, cost-effective alternative disposal options for the lower activity waste. The Department's high-level waste will originate from four sites: Hanford, Savannah River, Idaho and West Valley, New York.

A significant programmatic risk affecting successful completion of the high-level waste accelerated cleanup approach will be the final outcome of the Waste Incidental to Reprocessing ruling and the related litigation. In this case, the plaintiffs (the Natural Resources Defense Council, et al.) argue that the Department's authority to reclassify high-level waste as "incidental waste" in accordance with the Department's policy on Waste Management, violates the Nuclear Waste Policy Act. The United States District Court for the District of Idaho recently ruled against the Department. If this ruling is upheld, or there is a protracted delay in ongoing litigation, Environmental Management's current plans, cost and schedules could be significantly impacted.

If the Department is forced to abandon the use of the Waste Incidental to Reprocessing Determination process for high-level waste segregation and treatment, projects at the Hanford Office of River Protection, Savannah River Site, Idaho National Laboratory and West Valley Site would be impacted. Near-term activities, such as saltstone processing and tank closures at Savannah River, were impacted in Fiscal Year 2003 and currently impact activities in Fiscal Year 2004. In a letter from Secretary Abraham to House Speaker J. Dennis Hastert, the Department has proposed an amendment to the Nuclear Waste Policy Act which would allow the Department to proceed with its high-level waste cleanup phase.



Assessment and Commentary: Target not met. At Hanford, deteriorating fuel at the K-basin led to the need to wash additional canisters and other changes in technical approach which is slowing the process. The contractor has submitted a recovery plan to achieve removal of a total of 2,106 metric tons heavy metal of K-Basin Fuel by July 31, 2004. The 2,106 metric tons heavy metal number includes the Fiscal Year 2003 variance plus the Fiscal Year 2004 goal of 631 metric tons heavy metal. The balance (eight metric tons heavy metal) of Shippingport fuel should be shipped by end of Fiscal Year 2004. Therefore, the variance in Fiscal Year 2003 will not have an impact on the completion of this activity.

GENERAL GOAL 7 - NUCLEAR WASTE:
License and construct a permanent repository for nuclear waste at Yucca Mountain and begin acceptance of waste by 2010.

Associated with the Nation's energy supply is the Federal responsibility for the ultimate repository for spent nuclear fuel and high-level radioactive waste. This responsibility includes licensing, building, and operating a deep geologic repository at Yucca Mountain, Nevada, for the disposal of commercial and the Department's spent nuclear fuel, high-level radioactive waste, and surplus fissile materials. In 2002, the President signed the joint Congressional Resolution designating Yucca Mountain, Nevada, as the site of the Nation's first geologic repository for high-level radioactive waste and spent nuclear fuel.

The Department will pursue two strategies to accomplish this goal. First, the Department will establish a

permanent geologic repository for high-level waste and spent nuclear fuel at the Yucca Mountain, Nevada, site. Second, the Department will investigate advanced technology options to promote future waste-management alternatives, which could significantly reduce the amount of future spent nuclear fuel requiring disposal.

The Fiscal Year 2003 budget request of \$591 million for the Department's repository program would support the completion of work needed for the submission of a license application to the Nuclear Regulatory Commission in 2004, and the development of transportation capabilities needed to initiate repository operations by 2010. However, the \$134 million reduction from the President's budget request, together with the four month-long Continuing Resolution, has introduced a high level of risk in our ability to meet a December 2004 license application deadline, but the Department is making every effort to meet this schedule.

The Department's Advanced Fuel Cycle Initiative program will provide a means to develop and deploy reconditioning technologies to reduce the volume of high-level waste from spent nuclear fuel, thus reducing the need for long-term geologic disposal, and providing for proliferation resistant technologies to recover the energy content in spent nuclear fuel.

EXTERNAL FACTORS

The following external factors could affect our ability to achieve our goals:

- **Regulatory Requirements:** The Nuclear Regulatory Commission is responsible for approving a Departmental license application for Yucca Mountain. Any delay in issuing a license could delay the commencement of repository operations.
- **Litigation:** It is likely that any Nuclear Regulatory Commission decision to issue a license to construct and operate a repository at Yucca Mountain will be challenged in the courts.

HOW WE SERVE THE PUBLIC IN THIS AREA

This program is a key priority for the Administration. The ultimate consolidation and disposal of nuclear waste at Yucca Mountain will support national security and energy security, reducing the number of locations



Yucca Mountain, on the southwest boundary of the Department's Nevada Test Site, has been determined suitable for the Nation's first repository for commercial high-level radioactive waste.

where nuclear materials are stored and maintaining the viability of the Navy's nuclear powered fleet. Nuclear waste disposal is essential for maintaining the viability of the commercial nuclear power industry, which currently supplies more than 20 percent of the nation's electricity. Spent nuclear fuel and high-level radioactive waste is stored at 129 sites in more than 30 states.

PERFORMANCE RESULTS

The Department was generally successful in meeting performance expectations during Fiscal Year 2003. Despite the significant funding shortfall, the program is still on track to request approval in December 2004 to begin constructing the repository. Critical activities to support construction and transportation are being planned and scheduled to support the long-term program goal of waste receipt in 2010. The various Departmental elements are working together to coordinate and integrate spent nuclear fuel and high-level radioactive waste functions.

Program Goal RW 2-1: Obtain a repository construction authorization from the Nuclear Regulatory Commission in 2008.

Target RW 2-1b: Complete development of repository conceptual design and request Acquisition Executive approval to start preliminary design, which will be used in the license application.



View of an exploratory tunnel dug by the 25-foot-diameter tunnel boring machine at Yucca Mountain.

Assessment and Commentary: This target was met. Approval to begin preliminary design is a significant first step in the process of designing the repository surface and subsurface facilities and the waste package which are important components of the license application.

Program Goal RW 2-2: Develop the national and Nevada transportation infrastructure to support the anticipated shipment of spent nuclear fuel and high-level radioactive waste to the repository, beginning in 2010.

Target RW 2-2b: Develop and issue the Office of Civilian Radioactive Waste Management Strategic Transportation Plan.

Assessment and Commentary: This target was not met. The Director of the National Transportation Program assumed his position on August 18, 2003. Although his predecessor, serving in an acting capacity, had initiated the transportation strategic planning process and produced a draft Plan, the permanent Director will conduct an initial survey of the Department's transportation program and to modify the draft report to ensure that, based on his expertise and experience, it reflects the optimal strategies for success. The Director has collected the necessary data and established the milestones required to build and operate an effective transportation program. The Strategic Transportation Plan will be issued during the first quarter of Fiscal Year 2004.

Although the issuance of the Strategic Transportation Plan was not completed by the end of Fiscal Year 2003, its issuance in the first quarter of Fiscal Year 2004 is not a significant delay, and should have no impact on the Program goal of developing the transportation infrastructure required to support the anticipated shipment of spent nuclear fuel and high-level radioactive waste to the repository in Fiscal Year 2010.

CHALLENGES AND EXPECTATIONS FOR THE FUTURE

The Department will continue to implement improved strategies for achieving the accelerated cleanup goals. In Fiscal Year 2003, a new budget structure was developed to better align resources and activities. Human capital management strategies will be implemented to realign and focus the workforce on the mission. During Fiscal Year 2003, a senior executive mentoring program was implemented with the objective of having a cadre of executives who are well-rounded and prepared to effectively lead. In Fiscal Year 2004, the Department will continue to implement human capital management strategies that will realign and focus the workforce on the accelerated cleanup and risk reduc-

tion mission. Recommendations developed by corporate level project teams will be implemented to further enhance the efficiency and effectiveness of the cleanup program.

Pending litigation with the commercial utilities places significant uncertainty on the Government's funding liabilities. Based on the controversial nature of nuclear waste transportation and disposal, there are many institutional barriers and constituencies that oppose the project. It is expected that additional litigation will be used as an obstacle as the project proceeds.

In order to meet the program's goals, significant funding increases are required in future years. While this program is a priority of the Administration, it will still be a challenge to secure funding from Congress in a climate of increasing deficits and competing national priorities.